

## **REMARKS**

Applicants have now had an opportunity to carefully consider the Examiner's comments set forth in the Office Action of November 28, 2007. All of the Examiner's objections and rejections are responded to herein. Reexamination and reconsideration of the application is requested.

### **In The Office Action**

Claims 18, 21-25, 29 remain in the application, Claims 19, 20, 26-28, 30-35 are cancelled without prejudice, and Claims 36-47 are added by way of this amendment.

The Abstract is objected to for exceeding 150 words in length, for using legal phraseology, and inconsistent reference numerals.

Claims 20, 21, 30, and 32 are rejected under 35 U.S.C. §112 as being indefinite for use of the term "substantially." Similarly, claim 23 is rejected for the use of the term "vertically above." In addition, claim 30 is rejected as being unclear.

Claims 18, 21, 22, and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paul (GB 2,162,294 A) in view of Edenhofer (US 5,722,825) and Reuter (US 5,035,405).

Claims 19, 20, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paul (GB 2,162,294 A) in view of Edenhofer (US 5,722,825) and Reuter (US 5,035,405) in further view of Mahr (US 3,693,812).

Claims 24 - 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paul (GB 2,162,294 A) in view of Edenhofer (US 5,722,825) and Reuter (US 5,035,405) in further view of Myers (US 2,892,744).

Claims 31 - 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paul (GB 2,162,294 A) in view of Edenhofer (US 5,722,825) and Höhne (US 4,622,006).

Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Paul (GB 2,162,294 A) in view of Edenhofer (US 5,722,825) and Höhne (US 4,622,006) and Reuter (US 5,035,405).

### **Informalities in the Abstract have been Addressed**

Per the Examiner's suggestion, the abstract has been shortened and objectionable legal phraseology has been removed. In addition, all reference numerals have been removed to further shorten the abstract, while also resolving any numeral inconsistencies.

### **Claims 20, 21, 23, 30, and 32 are No Longer Indefinite**

The Examiner's objected to the use of the term "substantially" in claims 20, 21, 30, and 32. Claim 20 has been incorporated into claim 18 and the term "substantially at right angles to" has been replaced with "at about a right angle to." Similarly, in claim 21, the term "substantially" has been replaced with the term "about." In both cases, it is commonly understood that the term "about" is synonymous with "generally equivalent to" or "approximately".

Claims 30 and 32 have been cancelled and are no longer of concern.

With respect to claim 23, the Examiner has stated that the term "vertically above" is indefinite. Applicant respectfully disagrees. On page 2 lines 21-28 of the application, the first opening (for the charging/discharging of parts into/out of the furnace) is taught as being disposed vertically above the furnace chamber in one particular embodiment. Furthermore, the application teaches that a charging sluice (or an elevator sluice in this embodiment) is disposed upstream of the first opening in the vertical direction (i.e., vertically above the first opening). This allows for the parts to be charged into the furnace in a vertical fashion rather than a strictly horizontal fashion. Applicant respectfully submits that claim 23 recites similar, if not identical, subject matter as recited in the specification and should be clear to one of ordinary skill in the art.

### **Claims 18, 21-25, 29 are Not Rendered Obvious by Paul, Edenhofer and Reuter, Mahr or Myers**

The Examiner contends that claims 18, 21-25, and 29 are rendered obvious in view of a combination of Paul, Edenhofer, and Reuter (Item 3 of the Office Action). Applicant respectfully disagrees. First, claim 18 has been amended to include the additional limitations of claims 19 and 20 and, as such, Paul, Edenhofer, and Reuter,

even if properly combined, no longer render claims 18, 21, 22 and 29 obvious.

Admittedly, Paul illustrates a rotary hearth furnace comprising outer and inner walls limiting a furnace chamber. Paul also discloses, partitions adapted to divide the furnace chamber into a heating zone and at least one treatment zone. However, Paul only teaches one opening that is provided in the outer wall of the furnace chamber. Thus parts cannot be charged and discharged in a continuous manner as the hearth rotates. In addition, Paul fails to teach a quenching means or a sluice means. Furthermore, Paul only teaches that the hearth is rotatable in one direction via the use of a hydraulically actuated ratcheting mechanism (see the Paul Abstract).

Edenhofer teaches that an outer wall of the furnace chamber is provided with two openings, one working as a charging opening and the other as a discharging opening, being provided with a sluice which can be a quenching chamber. But, Edenhofer only rotates in one direction and includes a single treatment zone. By comparison the claims 36-47 require that the first and second opening serve as charging and discharging openings for transporting the parts into or out of the furnace. Combined with the fact that instant invention teaches a bi-directional hearth, this has the added advantage of being able to vary the heating and treatment zones to a much greater extent. Furthermore, Edenhofer does not show vertically movable doors for dividing the furnace chamber into various heating/treatment zones. In fact, Edenhofer only teaches a single treatment chamber in the furnace. Heating takes place in a separate furnace 3 (Fig. 1 of Edenhofer). Thus, the rotating hearth of Edenhofer is only limited to a single treatment zone.

As to claim 22, involving the feature of the two charging/discharging openings for Paul, Applicant disagrees that such a feature would have been obvious in view of Edenhofer. Paul teaches only one charging/discharging opening. Edenhofer (and Hohne) which do disclose two openings, do not teach charging/discharging openings. Thus, two steps are needed for reaching the invention; firstly to provide the furnace of Paul with a second opening and secondly to design the second opening as either a charging or a discharging opening. No reason can be seen why one skilled in the art should have carried out these steps in combination with a furnace hearth which is rotatable in both directions. In fact, none of the references provide a reason for wanting

to vary the length of treatment and, hence, a need for bidirectional rotation. Thus, Applicant believes the Examiner is using impermissible hindsight.

Moreover, Reuter is not relevant to the claims of the instant invention. Reuter discloses a concept of heating and quenching of pieces under vacuum, the respective zones being connected by sluices. The Reuter device works strictly vertically, thus, no rotary hearth furnace is provided. In addition, the Reuter device does not permit for the continuous charging of parts as the forceps 8 must individually pick up the parts/charge 9 and perform the treatment process one at a time. Thus, a person of ordinary skill would not look to Reuter for improvements relating to rotary treatment furnaces.

The teachings of Mahr are entirely irrelevant because the Mahr reference is entirely concerned with charging a blast furnace with a granular material. Applicants assert that the term "charging" is used differently with respect to Mahr than with the instant invention. For one, and as is commonly known in the art, blast furnaces are used for the express purpose of melting base metals along with other additives in the production of molten and or alloyed metals. Furthermore, a charge of the type Mahr describes is usually added into the furnace for the purpose of creating heat or otherwise changing the composition of the molten metal. As used in the instant invention, the term "charging" describes the act of transporting discrete parts for heat treatment into the treatment furnace.

Also, Myers is of minimal relevance. Myers is primarily concerned with the treatment of metal strip material which is running through several treatment stations arranged in line one after the other. Thus, a person of ordinary skill would not look to the Myers reference for improving a rotary hearth furnace that treats individual, discrete, parts.

As to Hohne, a combination of two rotary hearth furnaces each having a charging opening and a discharging opening provided in the outer furnace chamber wall is shown. The hearth of each furnace is rotatable in both directions. However, this feature is provided for enabling different treatment times by charging the work pieces one after the other and discharging them individually. Thus, no teaching is given to the concept of the instant invention wherein two charging/discharging openings are operated by rotating the hearth in a bi-directional fashion. Moreover, because claims 30-35 have

been cancelled Hohne is no longer a concern.

### **New Claims 36 - 47**

With respect to new claims 36-47, both independent claims 36 and 43 are directed to a concept wherein the hearth is rotatable in both directions and wherein both openings disposed in the outer wall of the furnace chamber are adapted for working as charging/discharging openings. The combination of these features enables a high variability in working. Support for these features can be found in at least page 2, lines 7-12; page 5 lines 16-20; and page 8 lines 19-20.

Newly added dependent claims recite nearly identical limitations as previously recited with respect to claims 18-36. Moreover, based upon the review of the prior art cited by the Examiner, as set forth above, Applicant respectfully asserts that all of claims 36-47 are patentable over the cited art.

Thus, as described previously, the only marginally relevant documents Paul, Edenhofer and Hohne do not give any indication of a reason why one of ordinary skill in the art would have combined the prior art elements shown in Paul, Edenhofer and Hohne to arrive at a rotary hearth furnace including 1) a furnace hearth which is rotatable in both directions, 2) two charging/discharging openings provided in the outer wall of a furnace chamber of the furnace hearth, and 3) a sluice and quenching means combined with at least one of the charging/discharging openings. In this connection, attention is drawn to the Memorandum dated May 3, 2007 from Deputy Commissioner for Patent Operations Margaret Focarina to the Technology Center Directors in wake of the Supreme Court decision in KSR Int'l Co., v. Teleflex, Inc.

For these reasons, all remaining claims and newly submitted claims are believed to patentably define over the cited references, in any combination. Prompt and favorable examination of pending claims 18, 21-25, 29, and 36-47 is therefore respectfully requested.

### CONCLUSION

For the reasons detailed above, it is respectfully submitted all claims remaining in the application claims (18, 21-25, 29, and 36-47) are in condition for allowance. It is submitted that the foregoing comments do not require unnecessary additional search or examination.


A one (1) month extension of time is requested and payment for same is provided herein. No other fees are believed to be due by way of this Amendment. However, if another fee is due, the undersigned attorney of record hereby authorizes the charging of any such fee(s), except for the issue fee, to Deposit Account No. 06-0308.

In the event, the Examiner considers personal contact advantageous to the disposition of this case, he is encouraged to call the undersigned at the phone number listed.

Respectfully submitted,

FAY SHARPE LLP

March 28, 2008  
Date

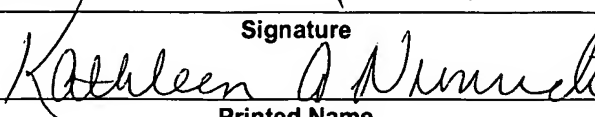
  
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#### CERTIFICATE OF MAILING OR TRANSMISSION

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